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ABSTRACT

The current status of research on experiential learning (primarily at the postsecondary level) is discussed, based in part on responses from a seven-member panel. Methodological considerations and proposed research agendas are also covered. Current research on experiential learning, which focuses on program design and impacts on the learner, falls into three main categories: program evaluation, career development, and personal-life skills development. While program-centered evaluation studies have provided a foundation of practical and theoretical information, the repertoire of research methodologies needs to be expanded. The most prevalent approach to research in experiential programs has been self-report surveys. Efforts need to be made toward using standardized tests/measures and enlarging sample sizes. The consulting panel recommended other approaches, including use of experimental and control groups, comparative studies of experiential learning, case studies, and longitudinal studies. Attention is also directed to four agendas that concern research on: experiential education practices and program structures, curricular concerns, ethnographic and demographic characteristics, and educational and public policies. Specific inventories and questionnaires are also described. (SW)

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PANEL Resource Paper #14

RESEARCH AGENDA FOR EXPERIENTIAL EDUCATION IN THE 80'S

by Jennifer Anderson
Linda Hughes
Jane Szutu Permaul

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PANEL Resource Papers
Peer Assistance Network in Experiential Learning

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RESEARCH AGENDA FOR EXPERIENTIAL EDUCATION IN THE 80'S

By

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INTRODUCTION

Having developed the "Bibliography of Research in Experiential Learning, Internships, and Field Studies" (Anderson, 1983), we could then answer the following questions: What is the status of research in experiential education? What areas have been sufficiently studied? What should be studied next? This paper addresses these and related questions. The observations and recommendations are based on responses from a panel of seven members[1] and our own experiences. Not surprisingly, the panel's responses confirmed our collective findings.

The paper is divided into three major sections. The first summarizes the current status of research primarily at the post-secondary level and draws heavily from critical reviews of the "Bibliography" by the Panel and the authors. The second section discusses methodological considerations and is followed by a proposed research agenda for the immediate future.

While the paper paints a somewhat discouraging picture of the state of the research, it is, we believe, reflective of the current state of experiential education as a field. It also indicates that a transition point has been reached which was

brought about by a certain maturity and self-critical consciousness that is both laudable and exciting. It is with this conviction that we propose a more disciplined and defined research agenda.

STATE-OF-THE-ART

So where are we in experiential education research? "There's such a paucity of empirical research in experiential education that it's hard to think of anything that has been covered sufficiently," responded Michele Whitham and echoed by other panelists and ourselves. An abundance of descriptive work has been done but the key word here is empirical, and the implicit focus is post-secondary education. Literature currently available on experiential learning focuses on program design and impacts on the learner and falls into three main categories: program evaluation, career development, and personal-life skills development. The early work in the field during the late 1960's and early 1970's were primarily theoretical, without a research base. They strove to justify the existence of programs as they struggled for institutional credibility. Simultaneously, program evaluations were being done for the same reason. In most cases, the information generated from these studies is limited and too program-, or student-, specific to be of general use. In other words, it is difficult to compare what happens to a high school student in a tutoring situation with the experience of a college student in a pre-professional business placement. About the only common ground is participant satisfaction.

The instruments used in these evaluations were usually

created for a particular program and were relatively untested for reliability or validity. They tended to be questionnaires, interviews, or self-reporting devices which produced anecdotal feedback and testimony on experiences. Out of these short-term studies came models for programs and a number of writings which are much like "how to" manuals -- how to: set up a program, develop placements, evaluate a student's progress and make transcript notations. In addition, they generated some evidence of the affective effects of experiential learning.

This early work, much of it connected to the activities and publications of the Council for the Advancement of Experiential Learning (CAEL), is extremely important and has produced a body of literature which has served as the backbone for the development of quality experiential learning programs at the post-secondary level. But this theoretical and descriptive information and program evaluation material should not be, and often is, confused with research. Ideally, research is empirically based, unbiased, systematic and rigorous, and the basic questions it proposes to answer, along with the methodologies used, are transferable. It is difficult to find patterns or comparable information in work done on widely diverse programs with instruments that are not standardized. However, given the realistic constraints of time and money, and the fact that most of the work is done by program administrators and not trained researchers, this ideal is hard to attain.

At approximately the same time as the studies described above were taking place, federal money became available through

the U.S. Departmer: of Health, Education and Welfare (HEW) to establish Cooperative Education programs. Cooperative education programs were originally very specifically designed post-secondary programs in which junior and senior students were placed in paid pre-professional positions primarily with federal agencies for six months and then returned to school for six months. This pattern was repeated, and upon graduation the student was to be guaranteed a job. Although many of the programs encompassed more than this narrow mission, they were primarily concerned with the student in the world of work.

Federal money was also available to evaluate the cooperative programs, and the resulting studies have provided a wealth of information about career development in college students. Most of it looks at attitudes changed and skills developed relevant to the world of work and success in terms of making career choices and being satisfied with a job. Also included are studies whose results deal with how to set up, implement and establish co-operative education programs in university settings. An interesting note here is that, with the exception of Lipton and Garza (1978), Sylvia Brown's work with cooperative studies has produced some of the only data which focuses specifically on women and minorities (1976, 1978).[2]

The cooperative education studies are an important beginning, but have limited applicability for post-secondary education due to their program-specific nature. Also the relationship between the student and the college or university curriculum (what is being learned and how) is unclear. Internships are looked at in isolation on a student-by-student

basis in a job context rather than in a curricular or pedagogical context. For some of the studies, the fact that these programs are based in universities or colleges seems almost incidental. The same information might be gained by placing non-college young adults between the ages of eighteen and twenty-five in work settings.

Due to current economic conditions, there has been a renewed interest in career development. Some recent works by Breen, Donlon and Whitaker (1975) and Jenks and Murphy (1981) look at career skills developed in a liberal arts curriculum rather than at the job site itself and make the connection between academic and career development more clearly.

The third area which has been researched fairly extensively is that of personal and moral development in students. The studies here focus heavily on the transition from youth to adulthood. They are mainly concerned with the development of life and career skills and producing responsible citizens. This work has been most rigorously conducted at the secondary level in the context of service-learning and career education. For instance, Conrad and Hedin have both conducted research and summarized the works of others in this area. They find that students gained social and psychological maturity by taking responsible roles in the community (1980). The most thoroughly documented and evaluated career-related program for high school students is Experience- Based Career Education (EBCE) which began in 1971 and was sponsored by the National Institute of Education. Much of this work is summarized in the research and writings of Owens and

Owens (1979), and more recently just Owens (1982) at the Northwest Regional Educational Laboratory (NWREL).

An exception to these studies focusing only on personal and career development is one done by Hamilton and Zeldin (1983), which looks at academic development as well. In addition to the development of positive attitudes, they measured knowledge gained by high school students in a government internship program and found that the interns gained more in both areas than those students in the classroom control groups.

Closely connected to this work on personal development at the high school level are the abundant studies on delinquent youth or "youth at risk" at the secondary level. These look at using experiential education, specifically environmental and outdoor education, as a tool for developing self concept, responsibility and personal strengths in students who may be disadvantaged or having difficulty with their lives or education. Studies of Foxfire, Outward Bound and other stress/challenge and outdoor programs are numerous and very interesting. But again, due to the narrowly defined nature of the work and the use of different instruments to measure growth and change even within studies on the same program, they are not generally relevant to experiential learning outcomes at the post-secondary level.

There are exceptions to the above which are mentioned by way of example in the third section of this paper. However, in summary, the majority of the research that has been done on experiential education gets at the "easy stuff" -- impacts easily measured with pencil and paper instruments and pre- and post-

tests -- and is concerned more with the affective than cognitive domain. This has produced a substantial amount of descriptive information, program evaluations and data on student satisfaction, changes in attitude and attitude formation, development of self-esteem, job placement, basic career skills acquisition, and some information on student characteristics. The motivation for doing this work was almost entirely program justification and evaluation, and it was undertaken, for the most part, by program administrators. The financial support came primarily from program budgets, with the exception of The Kellogg Foundation grants for CAEL, Health, Education and Welfare (HEW) and National Institute for Education (NIE) monies for cooperative programs and EBCE respectively[3] and Fund for the Improvement of Post-Secondary Education (FIPSE) support for selected post-secondary programs.[4] The work completed has served a clear and important purpose. However, now it is time to refine the instruments and invite other fields such as educational anthropology and psychology with their different methodologies to join us in the search for new data and information relating to the teaching-learning process.

METHODOLOGICAL CONSIDERATIONS

Given the predominance of program-centered evaluation studies, past research data offers little in the way of broad understanding about either the process or the impact of experiential education. It has, however, provided the essential foundation of practical and theoretical information that has fueled interest in further work. But the repertoire of research methodologies must be expanded so that data can be compared and

generalized from a variety of experiential activities related to different levels and types of education.

The general subject of research methodology in experiential learning can be broken into two categories:

--research approaches

--research tools

By research approaches we mean the experimental design by which data are generated, collected and analyzed for a study. Research tools are the actual instruments used to collect data, whether they are field observation tools, psychological-social development tests, achievement measures, or journals.

Approaches

The most prevalent approach to research in experiential programs has been self-report surveys. While this provides useful information, particularly on affective outcomes, it is limited. At a minimum, efforts need to be made toward using standardized tests and measures and enlarging the sample sizes. The consulting panel suggested other approaches to amplify the methodologies available to experiential education researchers. They recommended:

--Use of **experimental and control groups**, for example, to study the effects of field settings on learning;

--**Comparative studies** of experiential learning and other learning modes to better understand how learning occurs from firsthand experience;

--**Case studies** utilizing data gathered from in-depth interviews, field observations, critical incident analysis

and other records kept on students;

--**Longitudinal studies** tracking students from college entry to graduation and beyond.

Further, it was generally agreed that research methodologies used in anthropology, psychology, sociology, history, languages and other disciplines should be considered. For example, the various naturalistic observation techniques used by social scientists can be valuable to our research. An adapted version may even have immediate practical uses. Just what should one look for when making a "site visit," for example?

Structured field notes in lieu of random journals from students also can enlighten our understanding about the process and the impact of experiential education. Rich data can be extracted from journals in accordance to major themes, expressions and incidents about the student experience - an approach used frequently by language scholars. Finally, if the historians are able to understand contemporary phenomena by studying the past, surely we can benefit too by borrowing their techniques.

Tools

Clearly evidenced in our reviews of completed research were many custom instruments in the form of questionnaires designed for use with specific programs. Most of these instruments contain a section on demographic questions, agreement-disagreement items regarding different aspects of the experience, and open-ended items. Such questionnaires can be effective in obtaining large amounts of information with relatively minimal effort and

cost.

To overcome the limitations of program-specific questionnaires, a variety of standardized pencil-paper instruments currently available may be used to study changes in attitude, as well as cognitive and moral development. Most of these instruments have been developed from research exploring adult development and learning processes. (A list of some of these instruments appears in Appendix A.) Instruments which are most visible in experiential literature are:

--Learning Styles Inventories by Kolb and Canfield (1976)

--Learning Styles Questionnaire by Grasha-Riechmann

--Critical Thinking Appraisal by Watson-Glaser

--Framework for Student Development by Perry (1970)

While standardized paper and pencil instruments can generate large volumes of comparative information, the Panel urged caution in relying on them exclusively. Their reservations about this type of instrument include weak sensitivity to experiential learning effects, a tendency to focus on obvious truths, inadequate capacity to examine interrelationships, failure to relate the dimensions of experiential learning to specific educational outcomes, general inadequacy for qualitative testing of competence, and inability to address the face-to-face interactions that constitute a major portion of the field learning experience. To guard against these possible limitations, paper and pencil instruments should be employed in conjunction with other research tools whenever possible.

Another set of tools is available for purposes of quantifying information from journals, logs, reports and other writings, as discussed earlier. These include:

--Record and Reflection Log by Permaul and Miko (1976)

--Activity Sheet by Experience-Based Career Education of the Appalachia Educational Laboratory (1979)

--Taxonomy of Educational Objectives by Bloom (1956)

Others, including many of the enthnographic research tools, participant observations, structured interviews, and document collections may be borrowed from the social sciences to assist experiential researchers.

While the tools described above are primarily oriented toward data collection, new tools are becoming available to assist in data management and analysis. The increasing quality of microcomputer hardware and software bodes well for future research endeavors. Not only are analytical costs of research made easier to bear by these relatively inexpensive machines, but as computer programs are more widely used, standardized instruments and analytical packages will be easier to share or adapt. Some of the statistical computer packages which are already in use include:

--Statistical Package for the Social Sciences (SPSS)

--Biomedical Data Package (BMDP)

--Microstat

Implications

The difference in the type and quantity of data obtained

through different approaches is tremendous. It should be evident that the effort and level of support required to implement quality experimental designs and substantive studies are orders of magnitude greater than that required to undertake a simple survey.

For an experienced investigator, administration and analysis of a survey questionnaire to a sample population of 200, by generous estimate, entails perhaps 100 hours, or approximately 1/2 hour per student (40 hours for instrument development, 6 minutes per student to administer, 40 hours for analysis). By contrast, an in-depth study might entail 6,000 hours (20 hours per student for observation, interview, etc. and 10 hours per student for data reduction and analysis). So, while advanced methodological approaches are extremely desirable and must be implemented, we cannot afford to ignore the challenge to improve our present cost-effective paper and pencil methodologies.

While we have had some organized research efforts (i.e., Experienced-Based Career Education, 1981, and Cooperative Education, 1977), they do not address the more advanced levels of research, namely the application and testing of theoretical perspectives to understand experiential learning better. A conscious and comprehensive effort is now needed among researchers to develop and use more rigorous methodologies and standards to generate broadly applicable information about experiential learning processes and related outcomes.

First, existing evidence should be tested under controlled circumstances. Such studies would aim to corroborate or reject assumptions based on self-reported outcomes. For example, if

cognitve or attitudinal change is truly an outcome of experience-based education, then comparison groups with pre- and post-tests of attitudinal assessments and achievement measures will provide confirmation.

Secondly, where there is confirmation of particular educational outcomes from experiential activities, more in-depth studies should be undertaken to define the elements which generate those effects. It is important to note that such testing of current knowledge can be done on a small scale by focusing on small populations of interns from similar programs using consistent methods.

Third, and perhaps most importantly in a field short on professional researchers, is the need for the development of standardized research tools sensitive to experiential outcomes and useful in many settings. Practitioners and administrators can then draw on such instruments to undertake modest studies. Collectively, results from these independent investigations of similar programs would add greatly to the database on experiential learning.

A fourth recommendation is the creation of a research clearinghouse for practitioners. Key resources to be included would be:

--A data bank of experiential education knowledge;

--An inventory of existing standardized tools useful in measuring different aspects of experiential education, e.g. attitudinal, cognitve, developmental outcomes; and

--A set of detailed guidelines describing different research

designs and tools useful to the study of field-based learning.

The clearinghouse may also serve as the foundation of an organized research effort on experiential education outcomes and practices at the national level. This is a necessary response to repeated statements from our panelists concerning the current state of research and would help to insure the use of rigorous methods replacing the casual approaches of the past.

Efforts like these will help us more clearly delineate the various outcomes of experiential education, the environmental impacts that contribute to its success, and the general mechanisms of action behind field-based learning. We will then have the evidence, the knowledge, and the tools to support the validity of experiential learning in education today.

RESEARCH AGENDA

On what research should we focus our attention? There are obviously many possible research agenda which are equally worthy of attention. The one proposed here reflects the Panel's and our assessment of current needs and our appraisal of what is realistic.

As mentioned earlier, most existing data about experiential education are from evaluation studies, narrowly based on one, or at best a few, programs. It is necessary to broaden the base of inquiry, studying experiential education as part of the overall educational concern. Within the broader context, four areas seem to require immediate attention before other meaningful research can be conducted:

A) Studies of various experiential education practices and program structures and their effects based on selected learning, instructional and developmental theories;

B) Studies of curricular concerns relating substance to be learned with teaching-learning methodologies;

C) Studies of ethnographic and demographic characteristics in relation to program designs which include an experience-based component; and

D) Studies of educational, public and administrative policies and settings which effect the development and effectiveness of experiential learning programs.

Agenda #A calls for studying program designs and practices by breaking them into components in accordance with a theory selected for a particular research project. For example, some practitioners report that David Kolb's experiential learning cycle (1975) does not coincide with what students report about their learning. They see a break-down from learning specifics to generalizing from the specifics in their programs. This may very well be the case. There are several possible explanations for this discrepency. One is to discredit the experiential learning cycle theory. Another is to assume the program design did not allow students the opportunity to experience all four stages of the learning cycle. One way of making a clearer determination about this reported discrepancy is to structure specific activities which force students not only to experience, but to observe while experiencing, to reflect and generalize from the experiences and so on. Contrast this student group involved in structured activities with a group who is going through the regular program to see if different results are generated from different activities.

Such a study differs from current evaluative studies in

that distinct elements, characteristics essential or helpful to triggering or enhancing learning from experience, can be identified and tested for their effectiveness. Such knowledge can then lead to more effective learning designs for experiential educational programs. Borsak and Hursh have pursued this line of inquiry, attempting to identify the effects resulting from the "reciprocity" and "decentering" processes experienced by a sample of students involved in experiential education. (Borzak and Hursh, 1977)

In pursuing Agenda #A, there is no immediate need to develop new theories. Plenty are available to serve as bases for studies. David Kolb suggested several. (1983) One is based on Kurt Lewin's work which postulates "that learning is best facilitated in an environment where there is dialetic tension and conflict between immediate, concrete experience and analytic detachment" (Kolb, 1983). Many who developed educational techniques, such as the T-group procedure, have confirmed his theory.

Another theorist, Jean Piaget, concentrated his research on cognitive development. He discovered that different age groups of children think about the same things in entirely different ways. From his work such contemporaries as Lawrence Kohlberg, William Perry, and Jane Loevinger have developed their own stage theories more relevant to post-secondary students and dealing respectively with moral development, intellectual and ethical development, and ego development (Kolb, 1983). Still more recently, Albert Erdynast has studied adult stages of development by building on works of Piaget and others. (Erdynast, 1982)

A third and less known theorist suggested by Kolb is Paulo Freire. Freire argues the importance of what he calls "critical consciousness" in education. He claims that "the actual exploration of the personal, experiential meaning of abstract concepts through dialog among equals" is important to learning (Kolb, 1983).

There are many other theorists, such as Erik Erikson, Abraham Maslow and Arthur Chickering from whom we can learn. The point of Agenda #A, however, is not just to test the validity of theories. It is also to use them as the foundation for research in order to systematically and rigorously study the various elements and characteristics common to most experiential education approaches and discover new elements which may enhance experience-based education.

Not forgetting the importance of the broader context, this would imply not only studying the experience per se, but also investigating other critical components of the total experience - pre-requisites, journal keeping, seminars, lectures, reading assignments and anything else used in education. It would mean asking questions designed to assess the effectiveness of these various activities such as Wagner and Ehrensaft have addressed in their analysis of the Field Studies Program at the University of California, Berkeley (1979).

Agenda #B, very much related to #A, directs attention to the content of education. Most impact studies suggest that experiential programs have been successful in personal and career development. Experiential approaches can also enhance the teaching and learning of subject matters. Certainly this impact

has been proved and accepted in the fields of medicine and education with their required internships, in the arts, and in laboratory and field work in the natural sciences. There are also studies which indicate that this may be true for history and English. However, much more effort needs to be expended, especially on experiential education and the liberal arts. Is learning facts and figures more effectively done by lectures or by some form of experience-based method? Does the experiential approach lend itself more to teaching certain types of knowledge and skills than others? Does teaching mathematics and English require different sets of instructional strategies? What about such new subjects as computer literacy? And within experiential education should there be different mixtures of elements to enhance learning in different subjects? Ultimately, how much experience-based opportunity should be offered in a given curriculum along with other learning opportunities? These questions have been addressed for elementary age children, but are noticeably absent in discussions of secondary and postsecondary education.

The third agenda item is similar to #B but focuses on characteristics of the learners and the learning environment. There is enough evidence to suggest that different people learn differently. With the student population becoming more diverse and heterogeneous, it is important to determine if experiential education lends itself more to certain groups than others and in what ways. For example, what are the differences and similarities between secondary and post-secondary experiential

education, and why? What about adult students with substantial life experiences already behind them? Would they benefit more from vicarious, textbook and lecture approaches to learning? There are other groups whose numbers are increasing in educational institutions including women, ethnic minorities, socially-economically deprived, and new immigrants. Would any of these groups benefit from more hands-on approaches to education because of their varying backgrounds?

In addition to supplementing knowledge about learners, more information about the learning environment in the field is needed. Important findings have been gained from studies of work and classroom environments. David Moore has begun to pursue this line of inquiry, attempting to develop a coherent portrait of the learning environment at the field sites. (1981) Evaluations of inter-cultural experiential programs also suggest that both learner and environmental characteristics affect learning outcomes. (Hull and Lemke, 1975)

The last set of research questions comprising its own agenda is related to the domain of public and educational policies. Do current policies recognize the actual and potential contribution of experiential learning to education in general and at a specific level? What types of policies should be established? Tom Little states in his response to the review that "the human capital argument is a fruitful approach." He argues that "Research [is] needed to develop economic models for determining whether experiential learning is effective in human capital formation. I am persuaded that experiential learning can make the [economic] case for human capital development. It costs

the state not to subsidize experiential learning, not just because it is nice for students."

Related to questions of public policies are questions regarding field-experience sponsors be they government agencies, community organizations or business enterprises. What are the impacts on them? Does placing students in their operations cost them, help them, or do they come out even? Given what may be learned from these studies, the next question may then be who should pay the cost of experiential education -- students, educational institutions, field sponsors, local, state, federal government or some combination?

Close to the broad policies and economic questions is the need to study various administrative structures and practices under which experiential education programs function. Certain administrative models may be more cost-effective than others in different situations. Most existing programs are administered on an ad hoc basis by whatever program personnel are available. The time has come to systematically analyze cost and program effectiveness, perhaps borrowing from theories and research in management science.

The research agenda proposed here is extraordinarily broad because research in experiential education is, indeed, still in its infancy. On the other hand, it attempts to put some order and discipline into the next phase of these activities. Despite this ambitious agenda, no part of it can be realized if these concerns are not introduced to the attention of more people and organizations whose prime goal and function is research. Until

now, most research has been conducted as a peripheral activity of program practitioners.

We now need to get more educational researchers interested in experiential education and financial support for these efforts. It seems both of these needs can be accomplished if experiential education is viewed in the broader context of education and its value emphasized, not only for improving education, but as an integral and necessary part of it.

Notes

1. See Acknowledgement for a list of panelists.

2. The majority of the cooperative studies are available through the Cooperative Education Information Clearinghouse and Research Center at Northeastern University in Boston.

3. Important work, supported by NIE, include those at the Northwest, Far West and Appalachian Educational Laboratories. L. Jenks and C. Murphy, Integrating the Community and the Classroom: Implementing at the Postsecondary Level is an example of NIE-supported research.

4. H. Zanville and R. Markwood, A Casebook on Practice in Internship Education is an outcome of FIPSE supported research.

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APPENDIX A

METHODOLOGICAL TOOLS AND APPROACHES

INSTRUMENTS:

Activity Sheet:

By Appalachian Educational Laboratory

Henderson, Harold L. and S. Hyre, "Contract Learning", Enriching the Liberal Arts through Experiential Learning, S.E. Brooks and J.E. Althof, Guest Editors. San Francisco: Jossey Bass, New Direction for Experiential Learning #6 (1979) pp.72 & 75

Bloom's Taxonomy:

Bloom, B.S., ed. Taxonomy of Educational Objectives: Handbook I, Cognitive Domain. New York: David McKay (1956)

Krathwohl, D.R., B.S. Bloom, and B.B. Masia, Taxonomy of Educational Objectives: Handbook II, Affective Domain. New York: David McKay (1964)

Cardall Test of Practical Judgment, Form 1962:

By Cardall, Alfred J.
Designed to measure problem-solving ability in everyday life: specifically, the ability to draw logical conclusions in business and social situations, applied intelligence versus potential. Also relative degree of drive or compulsion.

Available from: Cardall Associates
122 Edgehill Road
Balla Cynwyd, PA 19004

Record and Reflection Log:

Permaul, Jane S. and Marina B. Miko. Documentation and Evaluation of Sponsored Experiential Learning. Princeton, New Jersey: CAEL, Educational Testing Service (1976)

A monograph describing use of journals, logs, and matrix to document learning.

Evaluation Modality Test:

By Engelmann, Hugo O.
Measures an individual's tendency to assume a realistic, moralistic, or individualistic frame of reference in the evaluation process.

Available from: Psychometric Affiliates

PO Box 3167
Munster, IN 46321

Grasha-Riechmann Student Learning Style Scales:

By Shery Riechmann & Anthony F. Grasha
Developed to assess six student learning styles: Independent, Dependent, Avoidant, Participant, Collaborative, and Competitive. Each of the response styles is defined around three dimensions: attitudes toward learning, view of teachers and/or peers, and reactions to classroom procedures.

Available from: Educational Testing Service
Princeton, New Jersey 08541

Kolb & Canfield Learning Style Inventory:

A self-administered, self-scoring inventory based on experiential learning theory, designed to determine which of four learning modes (Concrete Experience, Reflective Observation, Abstract Conceptualization, and Active Experimentation) is most likely to be relied on by the respondent.

Available from: McBer Publishing Company
137 Newbury Street
Boston, MA 02116

Cognitive Orientation Questionnaires of Intolerance of Ambiguity:

By Kreitler, Hans
Three questionnaires based on three types of cognitive orientation corresponding to theoretical behavioral clusters of intolerance of ambiguity.

Available from: Hans Kreitler
Professor of Psychology
Tel-Aviv University
Ramat-Aviv, Tel-Aviv, Israel

Perry Framework for Student Development:

Perry, W. Forms of Intellectual and Ethical Development in the College Years: A Scheme. Holt, Rinehart & Winston (1970).

Perry's scale describes the progression found among college students from absolute, dualistic thinking through relativistic thought, to a commitment to ideas and values ultimately subject to reexamination.

Means-Ends Problem Solving Procedure:

By Platt, Jerome J. and George Spivak
Designed to measure an individual's ability to orient himself to and conceptualize means of moving towards a goal.

Available from: Jerome J. Platt
Dept of Mental Health
Hahnemann Medical College and Hospital
314 North Broad Street
Philadelphia, PA 19102

Job Analysis and Interest Measurement:

By Walther, Regis
Measures the personal qualities of an individual, other than aptitude, training or knowledge, which influence success or failure at a job. It uses variables relating to orientation, work content preferences, interpersonal behavior, formal organizational behavior, information analysis behavior and success criteria.

Available from: JAIM Research, Inc.
1808 Collingwood Rd.
Alexandria, VA 22308

Waston-Glaser Critical Thinking Appraisal:

The Watson-Glaser test requires the student to make inferences, deductions, and interpretations and to evaluate assumptions and arguments in the presented situations. Subscores for Inference, Recognition of Assumptions, Deduction, Interpretation, Evaluation of Arguments, Critical Thinking, and Objectivity.

Available from: The Psychological Corporation
757 Third Avenue
New York, NY 10017

Woodcock-Johnson Psycho-Educational Battery:

By Woodcock, Richard W. and Mary B. Johnson
An individually administered battery of 27 subtests assessing three major areas: cognitive ability/scholastic aptitude, scholastic achievement, and interest level. Norms are provided up to and including the geriatric level.

Available from: Teaching Resources Corporation

COMPUTER TOOLS FOR DATA MANAGEMENT AND ANALYSIS:

SPSS (Statistical Package for Social Science):

SPSS is a software package for data tabulation, statistical analysis, and general purpose data management. Its statistical capabilities include frequency distributions, breakdown analysis, cross-tabulation, Pearson, Spearman, and

Kendall correlations, t-test, scattergram, multiple regression, analysis of variance, survival analysis, and discriminant analysis. The data management facilities allow simplified handling of large files and subfile structures, recoding of existing variables, creation of new variables, and selection, sampling, and weighting of specific cases.

BMDP:

BMDP is a comprehensive software library consisting of a large variety of statistical programs using a common set of basic instructions. These programs include the features offerred by SPSS and support additional enhancements often desired by more sophisticated users. Interfaces to other programs are supported, enabling a user to modify a BMDP routine more easily than a corresponding SPSS routine.

Microstat:

Microstat is a set of interactive data entry, data management, and data analysis routines written in the BASIC language and intended for use on 8-bit and 16-bit microcomputers. While the spectrum of features is substantially less than offered by SPSS or BMDP, most of the SPSS functions mentioned above are supported. And though Microstat's speed is slow compared to its more powerful siblings, its ease of access and use go a long way to make up the difference. A number of strong competitors to Microstat have appeared, giving the potential user an excellent choice of packages.

Lotus 1-2-3:

1-2-3 is also an interactive package designed expressly for the microcomputer segment (specifically for the IBM-PC). Its statistical functions are severly limited compared to the other options discussed above. However, 1-2-3 has excellent capabilities to very rapidly and interactively sort and edit data in preparation for subsequent analysis. If simple, the analysis can be done within 1-2-3; otherwise it can be performed by another statistical package, with the results passed back to 1-2-3 for graphical manipulation, formatting, and output.

METHODOLOGICAL REFERENCES:

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Assessment at Alverno College. Published by Alverno College, 3401 S. 39th Street, Milwaukee, Wisconsin 53215 (1979).

How we define and why we do assessment? How to design good

graphics and evaluations, funded by Kellogg. Charts for assessing college experiential programs.

Astin, A. W., "Measuring Student Outputs in Higher Education," Outputs of Higher Education: Their Identification, Measurement, and Evaluation, B. Lawrence, G. Weathersby, V.W. Patterson, (Eds.) Boulder, CO: Western Interstate Commission for Higher Education, 1970.

Chickering, A., "Adult Development: Implications for Higher Education," The Adult Life Cycle: Training Manual and Reader. V. McCoy, C. Ryan & J. Lichentenberg, (Eds.) Lawrence: Adult Life Resrouce Center, University of Kansas, 1978.

Conrad, Dan and Diane Hedin. The Executive Summary of the Final Report of the Experiential Education Evaluation Project. Minnesota: Center for Youth Development and Research, University of Minnesota, 1980.

_____. Instruments and Scoring Guide from the Experiential Education Evaluation Project Minnesota: Center for Youth Development and Research, University of Minnesota, 1980.

Sixty-two pages with excellent bibliography and sample instruments, also good reliability and validity information.

Evaluating Service Learning Programs: A Guide for Program Coordinators. Washington, D.C.: ACTION National Student Volunteer Program (806 Connecticut Avenuen, NW, Washington, D.C. 20525) April, 1978.

Feer, Michael, "Informant-Ethnographers in the Study of Schools," Human Organization, 34:2 (Summer, 1975) 157-162.

Guba, Egon, "Toward a Method of Naturalistic Inquiry". Manuscript available at the School of Education, Indiana University, (February, 1978).

Lutz, Frank W. & Margaret A. Ransey, "The Use of Anthropological Field Methods in Education," Educational Researcher, 3:10 (November, 1974) 5-9.

Schatzman, Leonard and Anselm L. Strauss, Field Research: Strategies for a Natural Sociology. Englewood Cliffs, New Jersey: Prentice-Hall, 1973.

Smith, Nick, Ed. New Techniques for Evaluation, Vol. 2. Beverly Hills, California: Sage Publications, 1981.

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